

A SEARCH FOR COMPANIONS TO INTERMEDIATE MASS BINARY STARS

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There is abundant evidence that stellar companions are more commonplace among the more massive stars, but it is unknown whether or not the high frequency of companions extends to low mass stars and planets. Our goal in this proposal is to search for evidence of companions surrounding close eclipsing pairs of intermediate mass F- through B-type stars. Since these close binaries have periods of a few days, the search will focus on dynamically stable outer companions with orbital periods in the range 1 to 12 months. We will use precise light curves from Kepler of some 20 binaries to measure accurate eclipse timings, and we will search for companions by investigating periodic variations in the times of minima caused by the light travel time across the orbital displacement of the close binary. In favorable situations, we will be able to detect the presence of objects as small as gas giant planets. This work will begin the census of planets and other low mass companions around close binaries and more massive stars.